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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,363	06/19/2001	Ken Ogura	OKI.244	1079

7590 03/21/2003

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EXAMINER

NGUYEN, HA T

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 03/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/883,363

Applicant(s)

OGURA, KEN

Examiner

Ha T. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 17-19, 21 and 25-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-19, 21, 25-29, 32 and 33 is/are rejected.
- 7) ☒ Claim(s) 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Notice to applicant***

1. Applicants' Amendment and Response to the Office Action mailed 9-3-02 has been entered and made of record (Paper No. 11).

***Response to Amendment***

2. In view of Applicants' cancellation of the claim, the objection to and rejections of claim 20, have been rendered moot.

In view of Applicants' arguments and the amendment to the claims, the objection to and rejections of claims 17-19, and 21 under 35 U.S.C. 112 second paragraph, as being indefinite, have been withdrawn.

In view of Applicants' arguments and the amendment to the claims, the rejection of claims 17-19 and 21 under 35 U.S.C. 103, as being unpatentable over Carey et al. (USPN 5075965, hereinafter "Carey") in view of Pang (USPN 6177329) has been withdrawn.

Applicants' arguments have been fully considered, but they are not deemed to be persuasive. The response to these arguments will be incorporated in the new ground of rejection given below.

***Claim Objections***

3. Claim 27 is objected to because of the following informalities: in line 4, "second" should be --first-- . Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was

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commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103<sup>©</sup> and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 17, 18 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carey et al.(U.S. Patent 5075965, hereinafter "Carey") in view of Thomas et al. (U.S. Patent 5000818, hereinafter "Thomas") and Pang (U.S. Patent 6177329).

[Claims 17 and 26] Referring to Figs. 4-5 and related text, Carey discloses a method of fabricating an integrated circuit chip, comprising the steps of: laminating a first insulating layer 14 on a board 10; forming an electrode pad 11 on the board, the electrode pad serving as an input/output terminal; forming a conductive post 35, 37 on the pad (See fig. 4); wherein the metal layer filled in the second opening is substantially the same as the width of the conductive material layer in the first opening (see Fig. 1M). But Carey does not disclose expressly the process of forming the conductive post. However, the missing elements are well known in the art because Thomas, in Figs. 1B-1M, discloses a process of forming a conductive post comprising the steps of: laminating a second insulating layer 14, 16; defining a first opening 18 in the second insulating layer; filling the first opening with a conductive material layer 24 made of a conductive material; laminating a third insulating layer 30; etching and removing the third insulating layer, thereby defining a second opening 32 in the third insulating layer at the region of the conductive material layer ; filling the second opening with a metal layer 36 made of an electric connection material; and etching and removing the third insulating layer and the second insulating layer after said filling the second opening (See fig. 1M ); and Pang discloses forming a first resist pattern 114 and a second resist pattern 126 on the third insulating layer to form openings in insulating layers. Besides, it would have been obvious to have the second resist pattern formed so that a width of the metal layer filled in the second opening is wider or narrower than the conductive material layer in the first opening suitable to the design of a specific application. A person of ordinary skill is motivated to modify Carey with Thomas and Pang to obtain conductor of desired shape.

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[Claim 18] Carey also discloses wherein the electric connection material is molten solder 37 (or 35)(see col. 6, lines 18-41); and

[Claims 28 and 29] placing the board over a printed board after said etching and removing the third insulating layer and the second insulating layer, the electrode pad being aligned with a pad formed on the printed board; and heating the electric connection material to electrically connect the electrode pad with the pad formed on the printed board; wherein the electric connection material is solder(see Figs. 4, 5A, 5B and related text).

Therefore, it would have been obvious to combine Carey with Thomas and Pang to obtain the invention as specified in claims 17, 18, and 25-29.

6. Claims 19, 21, and 31- 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carey in view of Thomas and Pang, as applied to claims 17, 18, and 25-29 above, and further in view of Stevens (U.S. Patent 6376374).

[Claims 19, 21, 31] The combined teaching of Carey with Thomas and Pang discloses substantially the limitations of claims 19, 21, and 31, as shown above. Thomas also discloses etching and removing of the second insulating layer, thereby exposing a top and sidewalls of the conductive material layer (see Fig. 1M).

But it does not disclose expressly dipping a tip end of the exposed conductive material layer including the top and sidewalls thereof into a liquid plating bath filled with a molten electric connection material. Besides, it would have been obvious for a person of ordinary skill in the art to remove all or a portion of the second insulating layer to expose all or a portion of the sidewalls of the conductive layer to achieve desired the mechanical strength of the conductive layer.

However, the missing limitation is well known in the art because Stevens discloses the use of electrochemical process to deposit a capping layer (See par. bridging cols. 5 and 6 ).

A person of ordinary skill in the art is motivated to modify Carey, Thomas and Pang with Stevens to obtain good protection of the conductor material.

Therefore, it would have been obvious to combine Carey, Thomas and Pang with Stevens to obtain the invention as specified in claims 19, 21, and 31- 33.

*Allowable Subject Matter*

7. Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 30 recites “further comprising forming a filling insulating material on the first insulating layer and the electrode pad after said etching and removing the third insulating layer and the second insulating layer, to surround sidewalls of the conductive material layer and the metal layer”.

These features in combination with the other elements of the claims are neither disclosed nor suggested by the prior art of record.

*Conclusion*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha Nguyen whose telephone number is (703)308-2706 . The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308-3325. The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Ha Nguyen

Primary Examiner

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